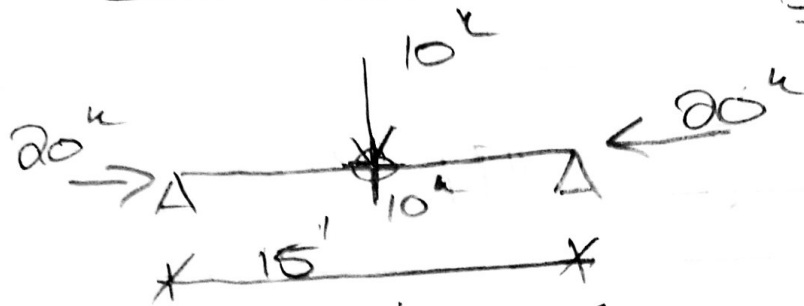


COMBINED AXIAL & 2-WAY BENDING



SIZE WITH MEMBER

$$M_{ox} = 10^k \times 15' / 4 = 37.5 \text{ k-ft}$$

$$M_{oy} = 10^k \times 15' / 4 = 37.5 \text{ k-ft}$$

$$C_b = 1.67 \quad (\text{NOT A CONSIDERATION FOR WEAK AXIS})$$

$$\text{START US / } Z_{req} = \frac{37.5 \text{ k-ft}}{0.9 \times 50 \text{ ksi}}$$

$$Z_{req} = 10 \text{ in}^3$$

$$\text{TRY W14x43 } Z_y = 17.3 \text{ in}^3$$

$$P (KL=10') = 2.37 \times 10^{-3}$$

$$b_x (L_b=10, C_b=1.67) = \frac{3.75 \times 10^{-3}}{1.67} = 2.24 \geq 3.41$$

↑
GOVERN

$$b_y = 13.7 \times 10^{-3}$$

$$(2.37 \times 10^{-3})(20^4) = 0.047 < 0.2, \text{ so}$$

INTERACTION =

$$\frac{1}{2} pPr + \frac{9}{8} (b_x M_{rx} + b_y M_{ry}) \leq 1.0$$

$$\left(\frac{1}{2}\right)(0.047) + \frac{9}{8} \times 3.41 \times 10^{-3} \times 37.5 + \frac{9}{8} \times 13.7 \times 10^{-3} \times 37.5$$

$$= \frac{1}{2} \times 0.047 + 0.14 + 0.58$$

$$= 0.74 \leq 1.0 \text{ ok.}$$

ITERATE AGAIN FOR NEXT SIZE DOWN, $W14 \times 38 \dots$